

What is claimed is:

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1. An article comprising:  
a gasoline engine having an exhaust outlet; and  
a close coupled catalyst in communication with the exhaust  
5 outlet, the close coupled catalyst comprising a close coupled  
catalyst composition having substantially no oxygen storage  
components, the catalyst composition comprising:

a support;

a palladium component;

10 optionally, at least one alkaline metal oxide selected from  
the group consisting of strontium oxide, calcium oxide and barium  
oxide;

optionally, at least one platinum group metal component  
selected from the group consisting of platinum, rhodium,  
15 ruthenium and iridium components;

optionally, at least one rare earth oxide selected from the  
group consisting of neodymium oxide and lanthanum oxide; and

optionally, a second zirconium oxide.

20 2. The article as recited in claim 1 further comprising  
at least one rare earth oxide selected from the group consisting  
of neodymium oxide and lanthanum oxide.

25 3. The article as recited in claim 1 further comprising  
neodymium oxide and lanthanum oxide.

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4. The article as recited in claim 1 further comprising  
a second zirconium oxide.

30 5. The article as recited in claim 1 wherein the support  
comprises at least one compound selected from the group  
consisting of silica, alumina, titania and first zirconia  
compounds.

35 6. The article as recited in claim 5 wherein the support  
comprises at least one activated compounds selected from the  
group consisting of alumina, silica, second zirconia and silica-  
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alumina, alumina-silicates, alumina-zirconia, alumina-chromia, and alumina-ceria.

5 7. The layered catalyst composite as recited in claim 6 wherein the support comprises activated alumina.

8. The article as recited in claim 1 wherein the alkaline metal oxide is strontium oxide.

10 9. The article as recited in claim 1 wherein the close coupled catalyst further comprises a the close coupled catalyst carrier which supports the close coupled catalyst composition.

10. The article as recited in claim 9 wherein the carrier comprises a honeycomb carrier.

11. The article as recited in claim 10 wherein there is:  
from about 0.50 to about 3.5 g./in<sup>3</sup> of activated alumina support;  
at least about 50.0 g/ft<sup>3</sup> of the palladium component;  
and  
from about 0.05 to about 0.5 g/in<sup>3</sup> of at least one alkaline earth metal component.

12. The article as recited in claim 11 wherein there is:  
from about 0.05 g/in<sup>3</sup> to about 0.4 g/in<sup>3</sup> of strontium oxide;  
from about 0.0 to about 0.5 g/in<sup>3</sup> of the second zirconium oxide; and  
from about 0.0 to about 0.5 g/in<sup>3</sup> of at least one rare earth metal oxide selected from the group consisting of lanthanum oxide and neodymium oxide.

13. The article as recited in claim 11 wherein there is:  
up to about 20.0 g/ft<sup>3</sup> of a rhodium component.

14. The article as recited in claim 11 wherein there is: up to about 60.0 g/ft<sup>3</sup> of a platinum component.

15. The article as recited in claim 11 wherein there is: from about 75 to about 300 g/ft<sup>3</sup> of the palladium component.

16. The article as recited in claim 10 wherein there is: from about 75 to about 300 g/ft<sup>3</sup> of the palladium component;

from about 0.75 to about 2.0 g/in<sup>3</sup> of activated alumina support;

from about 0.05 g/in<sup>3</sup> to about 0.4 g/in<sup>3</sup> of strontium oxide;

from about 0.05 to about 0.2 g/in<sup>3</sup> of barium oxide;

from about 0.025 to about 0.3 g/in<sup>3</sup> of lanthanum oxide;

from about 0.025 to about 0.3 g/in<sup>3</sup> of neodymium oxide; and

from about 0.05 to about 0.5 g/in<sup>3</sup> of the second zirconium oxide.

17. The article as recited in claim 1 further comprising a three way catalyst downstream and in communication with the close coupled catalyst.

18. The article as recited in claim 1 further comprising a downstream catalyst located downstream of and in communication with the close-coupled catalyst, the downstream catalyst comprising an oxygen storage component.

19. An article comprising:  
a gasoline engine having an exhaust outlet;  
a close coupled catalyst in communication with the exhaust outlet, the close coupled catalyst comprising a close coupled catalyst composition having substantially no oxygen storage components selected from the group consisting of cerium components and praseodymium components, the catalyst composition comprising:

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a support;

a palladium component;

optionally, at least one alkaline metal oxide selected from the group consisting of strontium oxide, calcium oxide and barium oxide;

optionally, at least one platinum group metal component selected from the group consisting of platinum, rhodium, ruthenium and iridium components;

optionally, at least one rare earth oxide selected from the group consisting of neodymium oxide and lanthanum oxide; and

optionally, a second zirconium oxide; and

a downstream catalyst located downstream of and in communication with the close-coupled catalyst, the downstream catalyst comprising an oxygen storage component selected from the group consisting of cerium components and praseodymium components.

20. A method comprising the steps of:

operating a gasoline engine, having an exhaust gas outlet;

passing an exhaust gas stream comprising carbon monoxide and hydrocarbons, and optionally nitrogen oxide, from the exhaust gas outlet of the gasoline engine to a close coupled catalyst, the close coupled catalyst comprising a close coupled catalyst composition;

contacting the exhaust gas with the close coupled catalyst composition, the close coupled catalyst composition having substantially no oxygen storage components, the catalyst composition comprising:

a support;

a palladium component;

optionally, at least one alkaline metal oxide selected from the group consisting of strontium oxide, calcium oxide and barium oxide;

optionally, at least one platinum group metal component selected from the group consisting of platinum, rhodium, ruthenium and iridium components;

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optionally, at least one rare earth oxide selected from the group consisting of neodymium oxide and lanthanum oxide; and optionally, a second zirconium oxide; and oxidizing at least some of the hydrocarbon and only a portion carbon monoxide in the presence of the close coupled catalyst.

21. The method as recited in claim 20 wherein the oxygen in the close coupled catalyst is substantially provided directly from the exhaust gas stream and from oxygen supplied from the palladium component.

22. The method as recited in claim 21 further comprising the steps of passing the exhaust gas from the close-coupled catalyst to a downstream catalyst.

23. The method as recited in claim 22 wherein the exhaust gas from the close-coupled catalyst to a downstream catalyst comprises carbon monoxide.

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24. The method as recited in claim 22 wherein the exhaust gas from the close-coupled catalyst to a downstream catalyst comprises at least 10 percent of the carbon monoxide which passed into the close coupled catalyst when measured according to FTP 1975.

25. The method as recited in claim 24 wherein at least 25 percent of the carbon monoxide passes from the close-coupled catalyst.

26. The method as recited in claim 25 wherein at least 30 percent of the carbon monoxide passes from the close-coupled catalyst.

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